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ABSTRACT

Two experiments using the same design and subjects drawn from the same populations tested two accounts of schema-directed text processing, the selective attention hypothesis that suggests readers identify text elements as important or unimportant on the basis of an engaged, operative, or subsuming schema; and the slot-filling hypothesis that states that important elements are learned simply because the subsuming schema provides a slot for them. In the first experiment, 16 policemen, 20 real estate students, and 19 education undergraduates rated the relative importance of sentences in a story after being randomly assigned to one of three perspectives: burglar, prospective homebuyer, and no specified perspective. Results revealed that reader perspective is a powerful determinant of perceived importance. In the second experiment, subjects, divided equally among the three perspectives, read the passage on a PLATO screen, one sentence at a time, with the reading times for all sentences being automatically recorded. Their recall was also tested by means of a free-recall protocol. Results once again confirmed the importance of perspective, with readers spending more time on those portions of the text relevant to their assigned perspectives. Although not conclusive, these results support the selective attention hypothesis, while providing no support for the slot-filling hypothesis. (JL)

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CENTER FOR THE STUDY OF READING

Technical Report No. 266

READING IN PERSPECTIVE: WHAT REAL COPS AND PRETEND BURGLARS LOOK FOR IN A STORY

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Abstract

Readers' existing knowledge structures (their schemata) influence the comprehension, recall, and perceived importance of elements that make up a text (e.g., Pichert & Anderson, 1977). In this study, two explanations of how schemata might function during encoding were tested. The selective attention hypothesis makes the prediction that activated schemata would lead the reader to identify certain text elements as important and cause an increase in processing for those schema-relevant ideas. The slot-filling hypothesis, by contrast, posits that a schema provides a ready structure into which relevant information can be easily assimilated with no more processing required. Both hypotheses predict that subjects, given different perspectives to take while reading a story, will identify appropriate text elements as most important and will recall more ideas relevant to their assigned perspective. The hypotheses differ in that only the selective attention hypothesis predicts that readers will spend more time reading perspective-relevant ideas. Two experiments were performed. In both, subjects were assigned to three perspective conditions (burglar, homebuyer, control), and were chosen to represent three naturally occurring perspectives (police, real estate, and education students). In the first experiment, it was found that subjects rated text elements relevant to their assigned perspective as more important than perspective-irrelevant ideas. In the second study, the text was presented via a computer-assisted instruction system that permitted the measurement of reading time for individual sentences. The results confirmed the powerful role of assigned, as opposed to naturally occurring, perspective in determining the likelihood of recall. Consistent with the

attention-focusing hypothesis, readers spent more time on sentences containing information important to their perspective.

Reading in Perspective:

What Real Cops and Pretend Burglars Look for in a Story

In order to describe human cognition, it is convenient to analyze it into structures and processes. Although these two aspects are inseparably intertwined, the study of cognition most often proceeds by focusing in turn on one and then the other. When attention is turned to modeling the structure, the nature of processing is relegated to convenient assumptions. Similarly, process models entail assumptions about structure.

Recent descriptions of text comprehension and memory have been directed toward structure as embodied by schema theory (see Anderson, 1977; Rumelhart & Ortony, 1977; Schallert, 1982; Schank & Abelson, 1977 for detailed accounts). Essentially, a schema represents a prototypical model of an object or event based on prior experience and specifies the component parameters and relations between parameters which constitute the model. The parameters of a schema are conceived of as slots or placeholders into which incoming information relevant to the schema can be assimilated. Because of theoretical concentration on the structure of cognition, experimental work in the area of text comprehension has focused on analyzing products, such as recall and recognition measures. Thus, we know from previous research (e.g., Bower, Black, & Turner, 1979; Pichert & Anderson, 1977) that information related to a reader's engaged schema is better learned and recalled than information not related to the schema. Few attempts have been made to observe or measure process variables directly. The question to be dealt with in this paper centers on the mechanism or mechanisms by which this increase in learning and recall is achieved. Anderson and Pichert (1978) have investigated the process by which schemata

facilitate recall, and found evidence that schemata guide retrieval. In the present research, we will investigate how schemata function during initial comprehension.

Specifically, we intend to test two hypotheses of how schemata enhance the learning and recall of prose material, selective attention and slot-filling (Pichert & Anderson, 1977). The selective attention hypothesis suggests that as people read, they identify text elements as important or unimportant on the basis of an engaged, operative or subsuming schema. Presumably, the important elements are those that are possible instantiations of slots in the subsuming schema. Because these text elements have been identified as schematically important, the reader allocates extra attention to their processing in order to incorporate the information into the activated schema. This extra attention results in the better learning and recall of those schematically important text items. For example, a prospective homebuyer would be expected to pay greater attention when reading text elements that refer to the condition of a home and its need for repairs (e.g., plumbing, roof) or the desirability of the location of the house (e.g., distance to nearest school) than to comments about the occupation of the previous owner. Bower (1976) advanced an early version of this hypothesis when he suggested that the higher a proposition was in a story structure, the more attention a reader would allocate to it.

According to the slot-filling hypothesis, a different set of predictions is made. Again it is assumed that the text elements are identified as schematically important or unimportant, but here the important elements are learned simply because the subsuming schema provides a slot for them. The assumption here is that the availability of a slot for the incoming

information reduces the necessity of allocating extra attention for learning that piece of information. In fact, even less processing than usual might be required. By this account, the slot provides a ready interpretation of the new information and reduces the processing demands when compared to more active construction. For example, consider again the homebuyer schema. As a prospective homebuyer reads about a home for sale, he/she expects certain types of information to appear. Items such as the price of the home, its location and a description of the number of rooms will nearly always be included. Since the homebuyer expects this information on the basis of his/her homebuyer schema, he/she should not require any extra attention or effort to assimilate it. The slot hypothesis is a direct descendant of Ausubel's (1963) concept of ideational scaffolding: meaningful learning requires that incoming information be meshed with existing knowledge structures. Also related to the slot hypothesis is Craik and Lockhart's (1972) suggestion that when the material to be learned is compatible with existing structures, it "will be processed to a deep level more rapidly than less meaningful stimuli and will be well-retained" (p. 676). While the slot and attentional hypotheses do not exhaust the possibilities of how schemata might influence processing during comprehension, they each give a reasonable account of why schema-relevant information is better recalled.

One way to test these two hypotheses is to manipulate the schematic importance of various text elements and see if readers' attention changes when they encounter these elements. In the present study, reading time was chosen as a proximal indicator of readers' attention. If the attention allocation hypothesis is correct and if the additional processing requires extra time, then readers should spend more time reading those sections of

the text which contain information relevant to their operative perspective. If the slot-filling hypothesis is correct, no additional time should be required.

Schematic importance was manipulated by asking readers to adopt an assigned perspective (Anderson & Pichert, 1978; Pichert & Anderson, 1977). Asking someone to assume a particular perspective may serve to focus attention on specific portions of the text in much the same fashion as supplying the reader with a set of instructional objectives (e.g., Rothkopf & Billington, 1979) or with inserted questions all querying the same sort of information (e.g., Reynolds & Anderson, in press; Reynolds, Standiford, & Anderson, 1979). On the other hand, the reader who assumes a perspective may come to expect certain types of information. The readers' knowledge of the types of information important to a burglar, for example, could prime them to process such information rapidly. Thus, although asking a reader to assume a perspective during reading may not be representative of all reading, it may approximate the task demands of directed study or of other situations where the reader anticipates and searches for certain types of information.

It should be noted that although the hypotheses to be tested have been stated in schema-theoretic terms, both the selective attention and slot-filling hypotheses are compatible with a range of other structural assumptions. Therefore, a test of these hypotheses will not differentially support schema theory as a description of knowledge structure. Rather, such a test may serve to elaborate the theory further by adding procedural information to the structural model.

So far, there is very little research in which reading times have been used to test the attentional and slot hypotheses, and that which has been done has produced conflicting results. Cirilo and Foss (1980) tested the selective attention hypothesis as it related to the structural importance of a sentence in a text. When target sentences were important to a story, as determined by hierarchical story structure analysis, they received longer reading times than when the same sentences were unimportant. Additional support for the selective attention hypothesis comes from research on the effect of inserted questions. Although studies in which overall reading times were measured have produced mixed results (see Faw & Waller, 1976; and Reynolds, et al., 1979, for reviews), when reading times for smaller segments of text have been examined (Reynolds & Anderson, in press; Reynolds, et al., 1979), it has been found that readers selectively attend to information made important by inserted questions and spend less time on material irrelevant to the questions. Rothkopf and Billington (1979) demonstrated a similar effect for reading times and number of eye fixations on sentences relevant to prememorized instructional objectives.

To date, there is little evidence favoring the slot hypothesis. In fact, with the possible exception of a study by Grabe (1979), there is no direct support. Indirect support can be drawn from a study by Steffenson, Joag-Dev and Anderson (1979) who asked American and Indian (natives of India) subjects to read two stories: one about a typical American wedding and one about a typical Indian wedding. They found that subjects not only recalled more of the culturally familiar passage, but also were able to read it in less time than the culturally unfamiliar passage.

There are, however, some difficulties with drawing conclusions about the viability of the selective attention and slot hypothesis on the basis of the existing evidence. In the study by Steffensen et al. (1979) only overall reading times were recorded. Analyses of total reading times can mask differences in reading time within a passage (e.g., Reynolds et al., 1979), and it is possible that within a passage, schema-governed selective attention was functioning. In the study by Cirilo and Foss (1980), importance was manipulated by having the same sentence appear in different stories, which may have introduced contextual confounds.

Grabe (1979, Experiment 1) has tested the selective attention and slot-filling hypothesis in a study in which reading times for individual sentences were analyzed and passage context was controlled. College students read an adaptation of Pichert and Anderson's (1977) story about two boys playing hooky or a story about a girl attending her first day of preschool. Before reading the story, subjects were asked to assume one of two assigned perspectives: burglar or homebuyer for the "playing hooky" story, and child psychologist or toy manufacturer for the "preschool" story. The stories were presented one sentence at a time by slide projector that the students could advance by pressing a key. An analysis of variance of reading times, with story, perspective, and sentence importance as factors produced no significant effects. This study failed to support the selective attention hypothesis and appeared to favor the slot-filling hypothesis because important text elements were recalled better, but did not require additional reading time. Grabe concluded that "on the basis of inspection time data, differences in recall could not be attributed to spending a greater amount of viewing time on sentences important to that perspective"

(p. 167). There are, however, methodological difficulties with the study which mitigate the impact of this conclusion. First, sentence importance was determined on the basis of overall importance ratings, apparently without respect to the raters' perspectives. Therefore, the test of the effect of sentence importance on reading time (and also recall) did not take into account importance as defined for a particular perspective. Rater perspectives were ignored despite their dramatic influence on importance ratings (Pichert & Anderson, 1977). Second, in order to control for differences in the length and difficulty of the sentences, Grabe standardized the reading times for each sentence setting the mean to zero and the standard deviation to one, before entering them into the analyses. Therefore, it would have been impossible to have found any difference between the reading times for important and unimportant sentences since the mean of each was, by definition, zero.

To summarize, the purpose of the present investigation was to test two accounts of schema-directed text processing. Assuming that readers recall more perspective-relevant information, reading times provide the test of process. If readers spend more time on perspective-relevant text segments, the selective attention hypotheses will be supported. If they spend an equal or greater amount of time on the irrelevant segments, the slot account will be upheld. A secondary purpose of the study was to examine the role of both "natural" and assigned perspectives. Asking people to assume an affected perspective may serve to focus their attention on relevant portions of the text, as does presenting them with objectives or inserted questions. At the same time, the reader's own background may provide ready niches into which appropriate information is assimilated without additional processing

demands. In the present study, subjects were recruited from police, real estate, and education classes in order to provide ecological analogues of the burglar, homebuyer, and control perspectives, respectively. This design also permitted a test of the generality of the assigned perspective effects across readers with varying backgrounds and interests. Two experiments are reported. The first tested the effect of natural and assigned perspectives on importance ratings and served to validate the perspective relevance of the selected sentences with the appropriate subject populations. In the second experiment, the text was presented by computer, and reading times were recorded.

In the present research, we attempted to improve on the previous work in several ways. First, subjects' reading times were recorded for each sentence. This allowed us to detect variations in the attention allocated to small segments of the same experimental passage. Second, importance was manipulated by varying the reader's perspective. This permitted a completely crossed design. What was important information from one perspective was unimportant from the other. Thus, possible confounding factors such as word frequency, semantic complexity, and sentence lengths were eliminated. Further, since the same passage was read regardless of perspective, possible confounds from the accompanying texts were also avoided.

Experiment 1

Method

Design and subjects. Reader background (police, real estate, education) and assigned perspective (burglar, homebuyer, control), both between-subjects variables, and sentence type (burglar vs. homebuyer), a within-subjects variable, were combined in a 3 x 3 x 2 factorial design. The subjects were

16 policemen enrolled in a summer training institute at the University of Illinois, 20 students in a course in real estate at Parkland Junior College, and 19 undergraduates enrolled in an introductory educational psychology course at the University of Illinois. Subjects volunteered and were paid for participation in the study.

Materials and procedures. The passage was an expanded adaptation of a story by Pichert and Anderson (1977), that related the exploits of two schoolboys who play hooky and spend the day "messing around" in the otherwise unoccupied home of one of the boys. The passage contains information that would be of special interest to a burglar (e.g., the location of jewelry and furs, the fact that the side door was usually unlocked) or to a prospective homebuyer (e.g., the panelled and carpeted den, the damp and musty basement). The 66-sentence, 914-word passage was modified so that individual sentences contained information important to only one of the perspectives (20 for each perspective) or to neither perspective (i.e., 26 "filler" sentences).

Subjects were tested in groups of 5 to 20. The instructor explained that when someone reads a story, some parts of it seem more important than others. The subjects were told that their job would be to rate the relative importance of sentences in a story. They were asked to read through the entire story once before making their ratings. At each testing session, subjects were randomly assigned one of three sets of instructions: to take the perspective of a burglar and to keep that perspective in mind when reading the story and rating its sentences, to take a homebuyer perspective, or to read the passage with no perspective specified (i.e., the "control" perspective). The instructions were presented on the cover of a booklet

followed by an intact copy of the story and then each of its 66 sentences listed individually with an accompanying five-point rating scale. The rating scale ranged from "very unimportant" to "very important" (1 to 5, respectively). Subjects worked at their own pace and were free to refer back to the story and their ratings. Most raters finished in about 20 minutes.

Results and Discussion

Pichert and Anderson (1977) found that reader perspective greatly influenced rated importance as shown by very low correlations between mean sentence ratings for different perspectives. In the present study, we replicated this finding: the correlation between the mean ratings for the burglar and homebuyer perspectives, averaged across background groups, was .02. Correlations between the two perspectives within background groups were .20, -.25, and .12 for the police, real estate, and education groups, respectively. Correlations between different background groups within a perspective were much higher than between different perspectives. Correlations between police and real estate students, between police and education students, and between real estate and education students, respectively, were .75, .92, and .77 under the burglar perspective; .89, .90, and .96 under homebuyer perspective, and .59, .63, and .63 under the control perspective.

While the correlational analyses showed that subjects rated the importance of sentences in the story differently when asked to take a homebuyer's perspective than when asked to assume the burglar perspective, by themselves these analyses tell us little about where and how these ratings differ. Do these ratings diverge on some, most, or all of the sentences?

Is there a pattern to their disagreements? In the present study, a clear prediction can be made: The ratings of the two perspectives will diverge on those sentences which were written to communicate information important to one or the other of the perspectives. Therefore, an analysis of variance was performed on sets of sentences which we determined a priori to be of particular interest to burglars or homebuyers. This analysis provided a more revealing test of the effect of readers' background, perspective, and sentence type on subjects' mean ratings for the two sentence sets. In this and all other analyses of variance reported in this paper, the unweighted means method was used to compensate for unequal numbers of subjects. The mean ratings are presented in Table 1. The background of the rater was marginally significant, $F(2,46) = 3.08$, $p = .06$, $MS_E = .49$, as the police gave the highest overall ratings and real estate students the lowest (police = 3.27, real estate = 2.87, education = 3.14).

Insert Table 1 about here.

As anticipated, the main effects of reader perspective $F(2,46) = 2.27$, $p > .10$, and sentence type $F < 1$, did not reach significance, but the Perspective X Sentence Type interaction was highly significant, $F(2,46) = 64.5$, $p < .001$, $MS_E = .55$. As shown in Table 1, the ratings for readers in each of the assigned perspectives was much higher for perspective-relevant than perspective-irrelevant information. Every one of the forty sentences exhibited the predicted pattern. Simple main effects tests revealed that for the burglar perspective, burglar sentences were rated as more important than homebuyer sentences, $F(1,46) = 38.4$, $p < .001$, and that for the homebuyer perspective, the pattern of ratings was reversed, $F(1,46) = 89.3$,

$p < .001$. For the control perspective raters, the two sets did not differ significantly, $F(1,46) = 1.97$, $p > .10$.

The Background X Sentence Type interaction did not approach significance, $F(2,46) = 1.09$, $p > .30$, but the Background X Perspective X Sentence Type interaction was marginally significant, $F(4,46) = 2.43$, $p = .06$, $MS_E = .55$. Inspection of Table 1 reveals that police rated the burglar sentences as more important than did the real estate or education students under the homebuyer perspective (2.60, 1.49, and 1.66, respectively). This is consistent with the hypothesis that naturally occurring perspectives influenced perceived importance: The police raters evaluated the burglar items as important even when asked to pretend to be homebuyers. Perhaps security is a special concern of police homebuyers in the real world. Unexpectedly, real estate raters rated homebuyer sentences as less important than police or education students when asked to take on the burglar role (1.75, 2.91, and 2.81 respectively).

The study confirms Pichert and Anderson's (1977) finding that reader perspective is a powerful determinant of perceived importance. In contrast to text structure analyses which seem to suggest that importance is an inherent property of the text and therefore invariant across perspectives, the correlation of sentence importance ratings between the burglar and homebuyer perspectives approaches zero. Sentences designated a priori as homebuyer or burglar sentences were rated important or unimportant depending upon the assigned perspective of the rater, as signalled by the sizeable interaction between perspective and sentence type. Although there was a hint of an effect of reader background in a marginally significant three-way interaction, there was little evidence that burglar and homebuyer sentences were differentially valued as a function of the reader's background.

In order to provide a measure sensitive to the effect of reader perspective with which to test the focusing and slot-filling hypotheses in Experiment 2, ten homebuyer and ten burglar sentences were selected that maximized the difference between the means of the ratings from the two perspectives. Thus, for example, a sentence was included in the ten-sentence burglar set only if it was rated as very important from the burglar perspective and relatively unimportant from the homebuyer perspective. The sentences selected constituted an operational definition of the information important to the burglar and homebuyer schemata. Both groups of ten sentences were proper subsets of the twenty sentence sets selected a priori by the experimenters. The sentences selected were among the best discriminators for each of the background groups. The 10 homebuyer sentences represented the 7, 9, and 8 best discriminators among the police, real estate and education ratings respectively. The 10 burglar sentences represented the 8, 8, and 4 best discriminators among these same ratings. These ten-sentence sets were the bases of the analysis of reading time and recall in Experiment 2. Subjects for Experiment 2 were drawn from the same populations as in Experiment 1 in order to ensure the validity of the identification of perspective-relevant sentences.

Experiment 2

Method

Design and subjects. The 3 X 3 X 2 design was the same as in Experiment 1: Reader background and assigned perspective were between-subjects variables and sentence type was a within-subjects variable. The 37 police, 35 real estate, and 34 education students were recruited from

the same populations as in Experiment 1. Subjects volunteered and were paid for their participation.

Apparatus and procedure. The passage described in the first experiment was presented one sentence at a time on a plasma screen via the PLATO IV interactive computer-assisted instruction system. Presentation was subject-paced: When the reader pressed a key on the console, the currently displayed sentence was erased and the next sentence presented. The PLATO system automatically stored the exposure time for each sentence.

Subjects were tested in groups of six or fewer. As subjects arrived, the experimenters logged them onto PLATO, which assigned them to conditions according to a predetermined counterbalanced order, and then displayed instructions. Prior to the experimental passage, subjects read an unrelated 500-word story to familiarize them with PLATO text presentation. At the conclusion of the practice passage, subjects were informed that the most important story would follow. One-third of the subjects were instructed to take the burglar perspective, one-third the homebuyer perspective, and one-third received instructions that did not specify a perspective.

Following the instructions, subjects read the passage. Each time a subject finished reading a sentence, he or she pushed a button to view the next sentence. All sentences were presented at the same location in the center of the screen. The reading times for all sentences were automatically recorded. When subjects finished reading the passage, they spent a 10-minute filled retention interval working on the Miller Analogies Test before attempting recall of the passage. Recall instructions stressed that subjects were to write down everything they could recall about the passage. Subjects were told to recall the passage as accurately as possible, but to

express in their own words everything they could recall, even if they had forgotten the exact wording. Finally, subjects were given an eight-question debriefing questionnaire adapted from one used by Pichert and Anderson (1977). The questionnaire queried whether they remembered their perspective and the degree to which they had kept it in mind while reading and recalling the story.

Results and Discussion

Recall. The passage was divided into idea units, and the free-recall protocols were scored for substance or gist recall of the idea units identified. Interrater reliability for the scoring was .90. The proportion correctly recalled for the two ten-sentence sets selected on the basis of the ratings in Experiment 1 was entered into a three-way analysis of variance with background, perspective, and sentence type as factors. Eight of the subjects who read the passage and whose reading times were recorded withdrew from the experiment (due to schedule conflicts) before completing recall of the story and were excluded from the recall analyses.

The Perspective X Sentence Type interaction replicated Pichert and Anderson's major findings, $F(2,89) = 16.1$, $p < .001$, $MS_E = .013$. As shown in Table 2, subjects in the burglar and homebuyer perspectives each recalled more of the information relevant to their own perspective than they did of the other perspective-relevant information. Simple main effects tests revealed that readers assigned the burglar perspective recalled more burglar than homebuyer information, $F(1,89) = 44.4$, $p < .001$. Although readers with the homebuyer perspective did not recall significantly more homebuyer information, $F(1,89) = 2.10$, $.05 < p < .20$, the means of the two sentence sets were in the predicted direction. This was true despite the fact that

the burglar sentences were more memorable overall than the homebuyer sentences, as indicated by a significant main effect of sentence type favoring burglar over homebuyer sentences (.392 vs. .319), $F(1,89) = 20.4$, $p < .001$, $MS_E = .013$, and by a simple main effect indicating that control subjects recalled more burglar than homebuyer sentences, $F(1,89) = 6.64$, $p < .01$. Thus, although the recall of the homebuyer readers did not produce a statistically significant difference, it did reverse the overall pattern, lending additional support to the finding that perspective-relevant information is better recalled.

Insert Table 2 about here.

The Background X Sentence Type interaction did not reach significance $F(2,89) = 1.5$, $p > .20$. Although police recalled more burglar than homebuyer material, so did the other two groups. The main effect of background was significant, $F(2,89) = 10.1$, $p < .001$, $MS_E = .056$, as education students remembered most and real estate students least (police = .349, real estate = .265, education = .452). Neither the main effect of perspective, $F(2,89) = 1.69$, $p > .15$, nor the three-way interaction, $F < 1$, approached significance.

Two additional subsidiary analyses were conducted to examine recall of other sentences. A three-way analysis of variance of the proportion correct for the original 20-sentence sets produced the same pattern of results. A two-way analysis of variance of the 26 filler sentences important to neither perspective revealed a significant effect of reader background, $F(2,89) = 10.1$, $p < .001$, $MS_E = .026$, as education students again recalled most, real estate students least (police = .272, real estate = .208,

education = .385). This suggests that the effect of background on perspective-relevant items reported above was due to differences in the overall performance levels of the groups rather than anything specific to the perspectives involved. For the filler sentences, neither the effect of perspective nor the Background X Perspective interaction approached significance, both Fs < 1.

Reading time. Reading times were converted to milliseconds per syllable to control for sentence length, averaged across the ten-sentence rating sets, and entered into a three-way analysis of variance to test the effects of reader background perspective, and sentence type and their interactions.

The Perspective X Sentence Type interaction was significant, $F(2,97) = 3.85$, $p < .05$, $MS_E = .85$. Table 2 indicates that readers in both the burglar and homebuyer perspectives spent more time on those sentences important to their perspective. Thus, in the present study in which reading times of individual sentences were recorded, readers spent more time on perspective-relevant sentences. For homebuyer readers, the simple main effect of sentence type was significant, $F(1,97) = 5.5$, $p < .01$, as these readers spent more time reading the homebuyer than the burglar sentences. For the burglar perspective readers, the simple main effect was not significant, $F(1,97) = 2.06$, $.05 < p < .20$, but the trend reflected in the means was in the predicted direction and opposite to that of readers in the control perspective, $F(1,97) = 1.84$, $.05 < p < .20$. This result supports the selective attention or focusing hypothesis.

The Background X Sentence Type interaction was also significant, $F(2,97) = 5.1$, $p < .01$, $MS_E = .85$. Police spent slightly longer on burglar than homebuyer sentences (255 vs. 245 milliseconds), but education students

reversed this trend (240 vs. 262), and real estate students divided their time almost equally (253 vs. 257). For the police at least, this result seems to support the attentional hypothesis, with additional processing directed toward information relevant to the reader's background. None of the other effects approached significance, $p > .15$ in all cases.

Subsidiary analyses of reading times for other sentences produced little of interest. When the reading times for the original 20-sentence sets were analyzed, the pattern of results was quite similar, except that homebuyer sentences took longer to read than burglar sentences, and that the Background X Sentence Type interaction was only marginally significant, $p = .058$. In a two-way analysis of variance for the reading times of the 26 filler sentences, neither reader background, assigned perspective, nor their interaction was significant, $p > .15$ in all cases.

General Discussion

In the present study, the powerful role of perspective in the comprehension process was again demonstrated, confirming the results of Pichert and Anderson (1977). Importance ratings and the likelihood of recall were both affected by instructions to assume a particular perspective. Further, the study suggests that perspective instructions, and the schemata thus activated, act in part to focus attention and direct additional processing to the appropriate portions of the text. Regardless of their background, readers spent more time on those portions of the text relevant to their assigned perspective. Although not all of the simple effects tests revealed significance, all comparisons were in the predicted direction and those that failed to attain conventional significance levels represented reversals of the pattern of results exhibited by the control subjects. In addition,

reading time data from two additional experiments using similar materials and procedures favor the selective attention hypothesis (Reynolds, Note 1). Although the present research is limited by the fact that a single passage was used, the results are consistent with research demonstrating that inserted questions (Reynolds & Anderson, in press; Reynolds et al., 1979) and instructional objectives (Rothkopf & Billington, 1979) also produced longer reading times for relevant portions of the text. In addition, Cirilo and Foss (1980) have found support for the selective attention hypothesis as reflected by longer reading times for important sentences in texts.

It should be noted that Cirilo and Foss defined importance in terms of the position of a sentence in a hierarchical text structure, and manipulated importance by presenting the same sentence in different texts. In the present study we defined importance in terms of the reader's perspective, and therefore were able to manipulate importance while using the same sentences in the same text. In discussing their results, Cirilo and Foss emphasize the role of textual clues in the selective attention account. These cues might include "shifts in subject or verb tense, the type of connection between the current sentence and those preceding it (e.g., a temporal sequence versus causal implications), the presence of a referring expression that points to an already important referent, and so on" (p. 106). These cues mark those portions of a text which are important and determine where additional processing should be allocated. In the present study, however, the cues in the text were the same regardless of perspective. Thus, it was the reader's perspective and the schemata thus activated which

directed attention. The present study, therefore, represents an important extension of support for the selective attention hypothesis.

Our findings provide no support for the slot-filling hypothesis. The two encoding hypotheses, however, are not strictly mutually exclusive. There may be other domains in which the slot hypothesis will provide a better account of processing effects. Therefore, the present study should not be taken as strong disconfirmation of the slot-filling hypothesis. For example, in the two experiments by Reynolds (Note 1) reaction times to a secondary task were recorded as well as reading times. Reading time data once again supported the focusing hypothesis, but the secondary task data could be interpreted as consistent with the slot-filling notion.

Nor are the two hypotheses presented here jointly exhaustive of the possible explanations for the role of activated schemata during encoding. Cirilo and Foss (1980), for example, proposed an alternate hypothesis that would also predict longer reading times for sentences designated important in a story grammar structure:

> Alternatively, it is possible that high-level propositions are more difficult to integrate with the previous context as the overall macrostructure is being built during comprehension. High-level propositions typically introduce new material rather than expand upon material already presented. . . . In this sense, the content of high-level propositions may be less predictable than the content of lower level ones which tend to elaborate on already established ideas. (p. 97)

This analysis does seem to make the same prediction for reading times as the selective attention hypothesis, given Cirilo and Foss's importance manipulation. There are, however, two points which favor the selective attention hypothesis. First, the processing difficulty hypothesis is less

parsimonious than the attentional hypothesis in accounting for Cirilo and Foss's data: While the selective hypothesis predicts both longer reading times and better recall for important material, the processing difficulty hypothesis makes only the former prediction (Cirilo & Foss, 1980, p. 97) and in fact seems to imply that recall should be worse. Second, it is not clear that the processing difficulty hypothesis can predict the longer reading times for perspective-relevant information reported in this paper. Since the previous text is the same regardless of perspective, the relationship of a given sentence to this textual context will not vary, and no differences in processing difficulty are predicted. If one were to extrapolate from the processing difficulty analysis and consider the difficulty of integrating the information with the reader's perspective-activated schemata, the processing difficulty hypothesis appears to make the opposite prediction from the selective attention hypothesis. Burglar relevant information would seem to be more predictable from the burglar perspective and should therefore be processed more rapidly. Our finding, however, was that perspective-relevant information was processed more slowly, supporting the attentional hypothesis.

The present study did not demonstrate a very powerful role for the readers' background knowledge and interests, as neither importance ratings nor recall demonstrated the predicted effects. Readers' backgrounds did affect reading times, however, largely because the police spent more time on sentences containing information that would aid a burglar. There was also a nonsignificant trend in the predicted direction for recall. The failure to demonstrate a stronger effect for reader background may have been due in part to the recruitment of real estate students from an

introductory community college course. Perhaps these students were as a group too heterogeneous, and as individuals not sufficiently inculcated in the field, to have the elaborated and specialized knowledge structures needed to provide a strong test of the effect of reader background. Perhaps too, the use of the powerful assigned perspective manipulation tended to swamp any effects which might have been observed. In any case, the significant effect of reader background on reading time is suggestive and merits further study.

One final caution is in order. Our results show that reading times, as well as recall and rated importance, are affected by the relevance of information to a reader's assigned perspective. This finding is consistent with the selective attention hypothesis. It does not, however, prove that increased attention as reflected by reading time is necessary for improved recall. What readers did during that extra time is unknown. It is possible that it was spent in processes other than those that produced the improved recall (see Reynolds et al., 1979, for a more complete discussion). The results do, however, clearly demonstrate the effect of reader perspective during comprehension itself, just as Anderson and Pichert (1978) demonstrated its effect at retrieval.

Reference Note

1. Reynolds, R. E. Cognitive demands of reading. Paper presented at the annual meeting of the American Educational Research Association, Los Angeles, April 1981.

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Table 1

Importance Ratings for Burglar and Homebuyer Sentences[a]

Perspective	Background	Sentence Type	
		Burglar	Homebuyer
Burglar	Police (N=5)	4.07	2.91
	Real Estate (N=5)	3.88	1.75
	Education (N=7)	4.24	2.81
	Unweighted Mean	4.06	2.49
Homebuyer	Police (N=6)	2.60	3.91
	Real Estate (N=7)	1.49	4.37
	Education (N=5)	1.66	4.46
	Unweighted Mean	1.92	4.25
Control	Police (N=5)	3.25	2.91
	Real Estate (N=8)	3.16	2.58
	Education (N=7)	2.86	2.79
	Unweighted Mean	3.09	2.76

[a]Ratings ranged from "1", very unimportant, to "5", very important.

Table 2

Proportion Recall and Reading Time in Milliseconds per Syllable for Homebuyer and Burglar Sentences

Perspective	Background	Proportion Recall		Reading Time	
		Sentence Type		Sentence Type	
		Burglar	Homebuyer	Burglar	Homebuyer
Burglar	Police (N=13,13)[a]	.475	.256	240	229
	Real Estate (N=12,12)	.434	.256	293	278
	Education (N=10,11)	.569	.409	235	232
	Unweighted Mean	.493	.307	256	246
Homebuyer	Police (N=10,12)	.271	.299	282	275
	Real Estate (N=11,12)	.243	.267	250	263
	Education (N=10,11)	.423	.489	243	285
	Unweighted Mean	.312	.352	258	275
Control	Police (N=10,11)	.463	.332	243	231
	Real Estate (N=11,11)	.229	.162	216	231
	Education (N=11,12)	.423	.398	242	268
	Unweighted Mean	.372	.298	234	243

[a]Number of subjects for recall and reading time measures, respectively.